EFFECT OF TECHNOLOGY INVESTMENT ON THE FINANCIAL PERFORMANCE OF HEALTHCARE FIRMS IN NAIROBI

BY

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DECLARATION

I declare that this is my work and has not been presented to any institution or university other than The University of Nairobi for examination.

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DEDICATION

My research study is dedicated to the following: To the Almighty God for the good health, the strength and knowledge He has granted me. To my loving family for the endless support throughout my study, for the endless encouragements when I felt like giving up and their prayers. And Finally pay my tribute to my colleagues for the support through my study and for their understanding through the entire period.

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ABBREVATIONS AND ACRONYMS

FBOs - faith base organization

GOK - Government of Kenya

KMLF - Kenya Master list facility

MOH- Ministry of Health

NGOs - Non-governmental organizations

NHIF - National Health Insurance Fund

NHS - National Health Service

R&D – Research and Development.

SPSS - Statistical Package for Social Science

VIF – Valuation Inflation Factor

WHO – World Health Organization

ABSTRACT

Healthcare access is among the main agenda of the country's economic development. A health workforce leads to a gradual growth in the country's GDP. Healthcare technology investment entails the use of modern technology equipment to carry out diagnosis or in treatment of the particular ailment. However there has been a debate on whether investing in the new technology equipment improves the health of the people in the society. Use of invested technology requires complementary skills that come in hand with training on the use of the equipment. Also adopting to the technologies as they come is a risky process that in return brings potential benefits. The aim of this study was to ascertain the effect of technology investment on financial performance of healthcare firms in Nairobi. The population for the study was 9 healthcare firms in Nairobi. The independent variables for the study were technology investment as measured by natural logarithm of annual investment in technology equipment, IT cost as measured by the ratio of IT cost to total administrative cost, firm size as measured by natural logarithm of total assets and inventory turnover as measured by the ratio of cost of goods sold to average inventory. Financial performance was the dependent variable and was measured by return on assets. Secondary data was collected over a five 5-year time frame (January 2013 to December 2017) annually. Descriptive cross-sectional research design was employed for the study and the relationship between variables established using multiple linear regression analysis. Data analysis was undertaken using the SPSS software. The results of the study produced R-square value of 0.476 which means that about 47.6 percent of the variation in financial performance of healthcare firms in Nairobi can be explained by the four selected independent variables while 52.4 percent in the variation of financial performance of healthcare firms was associated with other factors not covered in this research. The study also found that the independent variables had a strong correlation with financial performance of healthcare firms (R=0.690). ANOVA results show that the F statistic was significant at 5% level with a p=0.000. Therefore, the model was fit to explain the association between the selected variables. The findings also showed that firm size produced positive and statistically significant values for this study while technology investment, IT cost and inventory turnover produced statistically insignificant values for this study. This study recommends that healthcare firms should invest more on assets as firms with higher assets were found to perform significantly better compared to firms with less assets.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Healthcare provision in many developing countries remains a challenge to many governments as they struggle to balance their priorities over the available resources. In most cases, a comprise to quality healthcare is done to cater for the development need of the country. Some of these challenges are insufficient medical personnel, limited medical facilities, as well as lack of proper infrastructure that assist in diagnosis or treatment of specific illnesses. Kenya Workers Report revealed that Kenya's current ratio of health workers in relation to its population is critically below international best practice and standards. According to John (2005), investing in technology involves spending a lot of money in order to achieve a significant effect on performance. However, scientific investigations and technology advancements only cannot guarantee immediate financial performance. The latest technology should be well implemented for it to yield higher returns (Zehir, 2010). Technology comes up as a solution to help bridge this gap and alleviate the pressure on medical infrastructure in Kenya. Investing on modern infrastructures that are up to date with today's technology assist a great deal in diagnosing and treatment of illnesses. This in return also tends to generate income for the healthcare facility.

Access to good quality and affordable universal healthcare for every citizen is a global concern and a national priority as envisioned by the United Nations 2015 development goals, (Osborn, Amy & Farooq, 2015). There has been exponential growth over the last decades in global investments technology especially in modern equipment. According to the innovation theory invented by Rodgers (1998), innovation keeps on changing over time through a social system. Improvement in the technology has over the years evolved and more healthcare facilities are quickly adopting to the new improvements on the technology investments.

Technology is an important aspect in the health industry since all healthcare interactions consist of either human interaction or application of technology or both. It is a major component of the current healthcare and probably a major driver in the of the future cost. According to Silber constraint theory by Silber (1975), he states that innovation is mostly done in firms that are less profitable or less innovative in order to maximize their profits. Current progress in the healthcare industry has the potential to be the major source of economic wealth as well as forces for change in the healthcare industry.

Technology investment on modern equipment is among the many inventions across the world, that has revolutionized the health sector in Kenya. Stakeholders in different sectors have invested in these modern machineries with different specifications suited to detect, analyses and treat different ailments. Most governments in the world today are committed to continuous improvement of the health by gradually raising budgetary allocations that go to their health sectors annually. This study will evaluate the application of investing in technology in promoting healthcare in developing countries. Our case study for consideration will be Kenya.

1.1.1 Technology Investment in Healthcare

Technology innovation is defined as a new idea or an improved service that has been commercialized or any substantially new improved process for the commercial production of goods and services Roger (1995). Investment technology is an innovation that aids in delivering of the technology innovation, (Jonathan & Andrew, 2016).

In the health industry, technology investment involves advancements and innovations on the machineries, plants and equipment that facilitate effective and efficient diagnosis and treatment of the different ailments. Technology investment in healthcare has helped improve service delivery in the sector, (Jonathan, 2017). Investment on healthcare has several crucial advantages whose

impact spreads across many potential uses. These advantages can be categorized into three important features; improved treatment and care, better patient communication and interaction and more health benefits to the society.

Integration of new technology is one of the main benefits in improving the quality of healthcare given from the healthcare providers. An example of these medical technologies has minimum invasive surgeries, better scanning and have better scanning devices where someone doesn't have to spend more time in recovery, instead, they spend more time enjoying life.

Finally, it is not just patients who benefit from more efficient health systems and quality medical information, good investment in technology also translates to broader societal benefits, (David, 2014). These benefits include; general improved access to health services, faster diagnosis and, specialized management of any associated illness, easy and affordable general public awareness of health risks and possible interventions, as well as an improved life-expectancy for members of the society, (WHO, 2016). Technological investments are also associated with improved innovation and solutions to common health problems in the society. Despite the fact benefits associated with the use of investment technology in healthcare and well known, adoption of the technology has been slow leading to a delay in its realization. In summary, we have the potential of creating a better and healthier society (Romaguera, German, & Klaucke, 2000).

1.1.2 Financial performance in healthcare firms

Financials performance refers to the extent to which the financial objectives are being achieved and also it is an important aspect of risk management. According to Verma (2017), financial performance is the process of measuring the operations of the firm and results of the firm's policies in monetary terms.

There are various measures of organizational performance. The most used measure, however, is profitability. Profitability has to do whether or not a firm's factors of production generate profits for it. Factors of production include; capital, labor and management. Probability analysis revolves around expense and revenue, as well as profit levels in relation to the size of business investment (Gilbert & Wheelock, 2007). There are four measures of profitability namely; rate of return of equity (ROE), the rate of return of the firms' assets (ROA), Net income (NI) and operating profit. ROE is used to measure the rate at which the owner's equity returns in the form of business. The ROA is used to measure the return of all the firms' assets and it mostly measures the overall profitability index. It's important to note that high value is directly proportional to more profitability in the business. Also, ROE when measured against ROA helps determine whether the business is generating profit on its investments from money borrowed. The income statement directly provides a glimpse into the net income of the firm which can be easily generated via matching the business revenue against the all incurred expenses, this is added to the gains or losses from business's assets, (Kwamboka, 2011). The net income represents all unpaid labor and operator, management and owner's equity that return to the business owner. It is prudent to note that similar to working capital, the generated net income is not a ratio but an absolute, hence comparison with other firms and businesses is futile since they all differ in size, (Gilbert & Wheelock, 2008). The gross revenue of the firm's returns is measured by the operating profit margin. This is because the focus is on each component unit produced that is earning profit while the asset turnover ratio is focused on profit from each component production volume, (Crane, 2011).

1.1.3 Technology Investment and Financial performance

At the organizational-level, innovation has been shown to be positively related to individual firm performance (Goosen, 2002). The retail health sector is a major industry that calls for higher levels of innovation. Healthcare is currently struggling under immense from various spheres of the economy and population. In researches carried out on the impact of technology on health service costs, it is presupposed that technology is expensive and, accordingly, increases the costs. However, if hospitals are to compete within this sector, they should be investing in newly developed and highly visible devices and procedures Heshmat & Loof, 2008). In addition to this, some technological developments can reduce the costs or the broadness of the utilization of such technologies can influence the costs (Wright, 2008). In regulations and reforms done on health services in many countries, reducing hospital costs without lowering the quality of the services becomes apparent as the key factor.

Li & Benton, (2009) argued that relative saving on cost and improvement on quality could be achieved through investing in new technologies and also in effective management. Clinical technologies such as laboratory, radiology or pharmacology technologies empower the healthcare firms to store medical data for patients making the patients history readily available when needed and also empower the hospitals to handle enormous amounts of information, (Marco, 2015). As a matter of fact, in our day a safe patient care has become inconceivable without computer based clinical systems. Clinical systems can immediately detect an interaction between the medications of the patient. These systems can also improve the performance of physicians and, in some cases, treatment results and prevent medical mistakes.

Both small and large healthcare organizations have successfully adopted the Electronic Health records (EHR), (Brijendra, 2013). Paperwork in the health sector is reducing as technology

improves. Many facilities are turning from paperwork to use of systems that can be fed with the patient's information. This mostly tends to be more accessible and reliable in terms of losing patients information. Also, Computerized Physicians Order Entry (CPOE) enables health practitioners to electronically place imagine orders, laboratory requests, drug prescriptions and other medical notices, thereby reducing the marginal error of hand-written requests, (Albert, 2014). It also allows other health practitioners in other departments within the health organization's EHR network access the orders and requests. This means, for instance, if a cardiologist in the EHR system prescribes a certain drug for a patient, the primary health practitioner will be able to access the prescription details, (Khanna, 2014). Apart from just ensuring a high reduction of errors such as duplication in prescriptions or patient-drug interactions that may potentially harm the patients, the EHR system is also fast, convenient which reflects heavily in the financial performance of the healthcare firms, (Kim, 2014).

1.1.4 Healthcare organizations in Kenya.

The health sector in Kenya is made up of the public health system and the private sector. The public sector is run by the MOH (Ministry of Health) and parastatals while the private sector is run by non-governmental organizations and well as private practitioners, (Murkomen, 2012). In summary, the healthcare system in Kenya can be categorized into three subsystems; the public sector, commercial private sector and FBOS. In term of infrastructure and healthcare facilities, the public sector leads, the commercial private sector follows and the finally the FBOS. The public sector is made up of certain health facilities levels which are National referrals, provision hospital, district hospitals, dispensaries and health centers, (Ministry of Health, 2014).

National referrals form the apex of the nation's healthcare system which provide sophisticated diagnostics, rehabilitative and therapeutic services. Kenyatta National Hospital and Moi Teaching

and Referral Hospital in Nairobi and Eldoret respectively are the two referral hospitals in Kenya. Aga Khan and The Nairobi Hospitals in Nairobi are the referral equivalent in the private sector, (Muga, 2004)

Provincial hospitals in Kenya are act as their district hospitals' referral centers. They act as an intermediary between district hospitals and the national health central level, as well as providing specialized healthcare. They also oversee district healthcare policy, ensure best practice is maintained and coordinate health activities on the district level. Similar private hospitals whose operational level is as public provincial hospitals in Kenya are Aga Khan Mombasa and Kisumu, (Kizito, 2004)

District hospitals in Kenya major on healthcare service delivery while generating their own budget requirements and expenditure following provincial headquarter guidelines. Health centers in general provide preventive and curative health services that cater for local needs, as well as ambulatory services and community health policing, (Mbayah, 2004).

Dispensaries, due to their proximity to residential areas, are meant to be the first point of contact with patients. However, in most areas in Kenya, hospitals and health centers are more effective and the first convenient point of contact with patients. Even so, dispensaries usually offer wider preventive healthcare on a wider scale, something that is a priority in Kenya's health policy. Government healthcare is widely supported by privately owned clinic and hospitals as well as religious-based organizations health centers, (Gakuruh, 2004).

Healthcare financing in Kenya is a multifaceted and received financial funding from government taxation, National health insurance funds (NHIF), employer health schemes, private insurance firms as well as NGOs. According to Kenya Master list facility (KMLF) (2016), responsible for

registering all health facilities in Kenya, there are 9,699 healthcare centers in the country. Approximately 4,616 of these centers are in the private sector, around 3,696 are owned by commercial private sector and 1,384 faith-based organization (FBOs) own 1,384 of these facilities. Despite Kenya being a frontrunner in the region when it comes to technological and economic developments, its prepaid cover in healthcare is a measly 25% which is basically NHIF. The remaining population of about 75% has no affordable medical cover and mainly relies on out of pocket expenditure.

The Vison 2030 in Kenya is part the national long-term development policy and the government of Kenya (GOK) whose main aim is the gradual transformation of Kenya through technology into an industrialized, middle-income nation that provides its citizens with a higher quality of life in a secure and clean environment, (Society for International Development, 2010). According to the Delivery secretariat (VDS) of The Vision 2030, Kenya has great potential of health tourism due to the growing market. In essence, Kenya needs to develop its health infrastructure in order to be at par and compete with other medical tourism destinations like India. The government admits that Public Private Partnership (PPPs) are crucial in driving international health tourism in the country. Kenya. Currently on average, 7,000 to 10,000 citizens travel abroad in search of specialized medical care.

1.2 Research problem

Healthcare access is among the main agenda of the country's economic development. A health workforce leads to a gradual growth in the country's GDP (Gross Domestic Production), (Munyua, Rotich & Kimwele, 2015). Healthcare technology investment entails the use of modern technology equipment to carry out diagnosis or in treatment of the particular ailment, (Iluyemi, 2016). However there has been a debate on whether investing in the new technology equipment improves

the health of the people in the society. Use of invested technology requires complementary skills that comes in hand with training on the use of the equipment. Also adopting to the technologies as they come is a risky process that in return brings potential benefits.

The research question and purpose of the project is to seek to bring out the importance of embracing investment technology in developing countries and the factors that spur its growth hence able to measure its financial performance on technology. Technology investment in developing countries continues to grow at un-precedent rate. It is estimated that in developing countries, the technology investment on infrastructure overshadows the road network as many countries have embraced the technology World Health Organization (WHO, 2011). This has brought about the need to harness and exploit this powerful tool in innovating new products and aiding service delivery across many sectors of the economy in the developing countries.

Kariuki (2016), did a research on technology investment adoption in Kenya and concluded that Kenya is well positioned in health-technology access and in future may enjoys more affordable healthcare access. This is clear on the Universal healthcare coverage that is currently ongoing where the Kenya citizens are urged to enroll to the NHIF (National hospital insurance fund) in order to access better, accessible and affordable healthcare in the coming years. Many studies have been done on healthcare adoption, technology and on their financial performance. However, the study had a research gap since it did not show how technology investment would have effect on the financial performance of the healthcare firms in Kenya.

A comprehensive study of the extent in which Kenya has embraced the technology investment in healthcare system will be carried out with an aim of establishing the prevailing challenges and thereby propose a model that can spur growth in the sector. Many health technology models have

been fronted in the market in the developed world to help grow the sector but many of these solutions may not be applicable to the developing world, (Eyring, 2011). This research will seek to propose a model that can be useful in advancing healthcare through the improved technology in the modern equipment in the developing world. The study's main objective is to conduct an empirical field research to investigate the factors that affect technology investment adoption in Kenya as well as financial performance of the organizations that embrace the technology. These research question therefore is: What effects does technology have on the financial performance of Kenya's heath care firms?

1.3 Research Objectives

The objective of this research study was to establish the effect of use of technology investment on the financial performance of healthcare firms in Kenya.

1.4 Value of the Study

The study may have implications on policy development. Findings from this study may provide information on relationship between financial governance and the financial performance of healthcare firms in Kenya. This study will enable to show the impact technology on modern equipment has on the financial performance of healthcare firms.

In practice, the study may benefit the private practitioners, or the small facilities of healthcare firms be able to invest in some equipment in their clinics. Such innovations may bring about sustainability and be able to create a competitive advantage in the healthcare industry and as a result to generate super profits.

Finally, the study may have implications contributed from on technological academic discussion implying building of theories. The results of the study may end up being inconclusive and the wide controversy surrounding the conclusion of technology investment.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This section entails the theories that support this study. In addition, this chapter outlines the conceptual framework. This chapter also provides the discussion of the empirical literature according to the objectives that discuss link between technology and financial performance of healthcare firms. Further, this chapter outlines the summary and research gaps.

2.2 Theoretical Review

Through the use of theories and models, it is possible to account for the impact of mobile technology on the financial outcome in the field of healthcare. Pertinent theories to this study will be evaluated to showcase the correlation between variables and the main intentions of the study. In this case, some of the theories include; Silber's Constraints Theory of Innovation and Schumpeterian Theory of Creative Destruction, The Innovation of Diffusion theory just to mention but a few.

2.2.1 The innovation diffusion theory

The innovation of diffusion theory was invented by Rodgers, (1983). This theory explains why, and how fast innovation is passed on through various avenues over a period of time among members of a culture. Rodgers stipulates diffusion as "the process through which an innovation is passed or communicated via other channels over a period of time through a given social system. Innovation refers to a new way of looking at something that has been there or a solution to a problem that has been affecting the community for a while. As a result, diffusion process results to the incorporation of behavior, new ideas and physical innovations. Features that enable the use of innovation are (1) compatibility, (2) relative advantage, (3) trialability, (4) observability and (5) complexity.

Compatibility alludes to the level to which a service is perceived as consistent to its users' beliefs and values, (Chen et al. 2004). In the words of Chen, et al. (2004), compatibility is an essential part of innovations and it is referred to the level at which a service is said to be in alignment with users' current values, beliefs, habits, lifestyle and present and previous experiences that can lead to a spontaneous rate of adoption, (Rogers, 2003).

Relative advantage means rate at which innovation is termed to be offering more advantages compared to its predecessors, (Lemuria, 2011). Research done shows that relative advantage of innovation is undoubtedly related to the adoption rate, which results in economic gains, enhanced strengthened status and more efficiency. According to the study, customers feedback has been able to show that use of mobile health is instrumental in terms of satisfaction, closeness and pocket friendliness. With no doubt, once consumers see an advantage that aligns with their course, they tend to approve it.

Observability of innovation portrays the degree to which an innovation is noticeable to its members from a social system, and the advantages can be simply observed and conveyed, (Rodgers, 2003).

The process of attempting a new technology before using it is known as variability. When given the opportunity to explore the new innovation, the potential adopters tend to feel at ease with it and as a result this raises their chances of adopting it. Perceived risk alludes to the level of risks in applying an innovation, (Ram & Sheth, 2008). This theory takes the active role of compiling data for the project, conceptualization and legitimizing the assertions.

To begin with, it stipulates that relative advantage, compatibility, complexity, trialability and observability are factors that determine the rate of adoption of an innovation. The above vital factors increase the chances of any innovation being adopted, (Rodgers, 2003). If it intrinsically

embodies these features, then it will help the firm overcome operational challenges and ensure above average returns. If the innovation adopts these features, it enables the firm to bypass any operational limitations and, in the process, promote exceptional profits.

Secondly, the number of hospitals using the new equipment will increase as the cost of technology reduces. Furthermore, as the cost of innovation goes down then the users pay less, and this increases the rate of usage and in turn the net earnings increase too.

2.2.2 Silber's Constraints Theory of Innovation.

Silber (1975) characterizes financial innovation by maximizing the profits of the firm to lessen the effect of different types of limitations that reduces profitability. The theory points out that financial innovation is used mostly in firms that are less profitable or less innovative in order to maximize their profits. Nevertheless, it should be noted that decrease in profitability may be as a result of external factors like competition and government regulations. Profitable innovations are essential in that they are used to reduce cost through information technology. In addition, the promote new product design and the financial sector too.

This theory is very relevant because it shows how productive innovations reduce the cost and thus improving the quality of performance at which the healthcare firms operate in.

2.2.3 Schumpeterian Theory of Creative destruction.

Creative destruction suggests the ongoing product the process of innovation where an older product is replaced by a new one.

According to Schumpeter (1928,1939), innovation is a continuous storm of creative destruction and there are fundamental forces that drive growth rate in a capitalist system. Due to the advancement of Schumpeter's thinking, a few scholars had differentiated his former thinking over

time. Innovation was largely dependent on exceptional individuals willing to take exceptional risk willingly. Individuals willing to face exceptional risk, were the only ones able to bring about innovation. This brought about his emphasis on innovation of oligopolies which was later erroneously seen as his main contribution to his work. His innovation on oligopolies which became considered as his main work came as a result of his emphasis on innovating oligopolies. Freeman (1994) & Schumpeter (1928), pointed out the disruptive nature of innovative change in capitalism that brings about indistinguishable blend of long-term growth and short-term instability. Schumpeter recognized the organization and social forces that played a major role in industrial change in his cyclical process despite the fact that he was not a technological determinist. Moreover, he insisted that visionaries in the business arena could be independent inventors or research development engineers in the large corporation. As a result, they could create opportunities for new gains through innovations. The emulators attracted by the super profits, would in response start a wave of investments that would gradually destroy proceeds for development. Before the economy could invent a set of advancements or new developments brought about by Schumpeter as Kondratiev cycle, they would develop and start the cycle all over again. Schumpeter emphasized the importance and role of timing economic cycles even though he did not explain the source of innovation. Due to this gap, the Keynesian economics were assured that the level of investment was the cause of innovation. The economists began to search for the sources of innovations during the 1960's. Roma requested innovation theorists to internalize the process of innovation within their models in 1994. Schumpeter's work on innovation has been aimed at the formation of innovation and its successive distribution between regions, industries and firms.

Keeping in mind the fact that investing in new technology is replacing the old one, Schumpeter's theory is vital to this study and also adds usefulness to the adopter.

2.3 Determinants of Financial performance of healthcare firms

According to Barley (2000), financial performance of a firm is measure using various combinations which include the bench marking, financial ratios analysis, performance measure against budget or a combination of all these methodologies. The overall assumption on the financial performance research is the increase in financial performance leads to improvement on the activities of the organizations.

Financial indicators reflect the characteristics of a growing firms, and the healthcare firms are among the growing firms in the industry. Healthcare firms are known to be involved more on evolved technologies than other firms, hence there is a high chance that the healthcare firms will show higher growth rate, production and more activities of financial indicators. Kim (2014), analyses the process of path analysis in that innovation activity will influence the innovation performance which will influence the operation performance of the firm and finally influences the sales growth. According to Raquel et al. (2015), knowledge stock is more significant on firm's productivity and the coefficient of effects are higher in high-tech companies than the non-tech companies.

According to Branch & Park (2009), firms that invest on research and development increases the firm's value, and in the process increases the sales and the profits of the firms. This is achieved when a company invests on research and development, which I turn leads to innovations in technology, which reduces cost and increases production hence resulting to increased profits of the company. Research has been done to show that there is a positive relationship between technology innovation and research and development, Pakes & Grilliches (2009). However, high-

tech firms should be consistent in innovation in order to survive in the advanced market technology, (D'Aveni, 2014). Healthcare firms are considered to have similar characteristics with the high-tech, therefore they are expected to have a high research and development rate.

There is a positive relationship between technology investments and a firm's financial performance. According to Park et al. (2006), financial performance is positively correlated to research and development and patent intensity which are the dependent variables in the technological innovations. In the small and medium enterprises, the high technology rating indicates better financial performance, (Kim et al. 2009). A study was done, and it showed that when high-tech firms discloses their supply contract, they reported excess returns and also the operating cost was higher than those for non-high-tech companies, (Kim & Kwon, 2015).

According to Biker, Hughes & Pinch, (2007), there are three principle factors that improve the financial performance of tech-institution; the size of the institution, the operation efficiency and the company's asset management.

2.4 Empirical Literature review.

Empirical literature review is direct search for public works including books, published works and periodicals that discuss the theories and present empirical outcomes that are relevant to the current topic at hand, (Zikmund, 2010)

The main driver for innovation in healthcare still stands to be information technology, (Gupta, 2008). Far less attention has been concentrated in communications and networking especially in the hospitals which have long been quick to adopt the technology in the treatments, procurement and medical services, since healthcare is was a service that was always administered locally and face to face.

A study done by O'Bryan (2013), the recent information systems of healthcare are created to work as silos. In this study, they deny the chance of accessing data punctually and making it globally integrated at the same time. For instance, trying to read a patient's chart from a different hospital may be impossible. Exchanging data electronically may become a challenge since distinct languages and measures will be used which brings about clashes among other software, (Mizani & Baykal, 2007). The patient's ability to use his/her medical records in different facilities is the main objective in this case.

According to a study done by Colorafi (2014), doctors' data collection system which is of high quality has been developed. For example, the doctors have been receiving contributions of medical records from scientists and doctors on websites like WebMD. Being enhanced by an automated search tool, it enables it draws its contents from medical journals and on-line textbooks, (Baker, 2018). This website has become a source of information for the medical world. Doctors are able to understand better the patients' medical history and also provide precise patients records which enhances the quality of healthcare in hospitals by using information technology, (Gleeson, 2015). The doctors avoid giving wrong prescriptions or wrong diagnosis which can be fatal by using the extensive patient's history at their disposal. The other option would be relying on the patient's memory which may not be accurate at all times.

A study done by Pan American health organization (2012), on the many cases of infant abductions that prompted the development of software program to track them around ten years ago. Labelling all items in the hospital like ventilators and monitors, enables the healthcare institutions to be ready in case of any emergency Some hospitals are labeling arriving patients to aid in cutting waiting time in the emergency rooms according to Landro (2015). Privacy experts should guide hospitals in protecting patient's privacy by ensuring that the personal data of patients is not exposed in the

public. According to a nonprofit group known as Emergency Care Research Institute (ECRI), the use of Radio frequency identification tags (RFID)is the most common tracking technology. As a matter of fact, ten per cent of the hospitals in the United States use this technology.

According to Greco & Eisenberg (1993), it is difficult to change the behavior of clinicians in their medical practices. Faulkner & Kent (2001) stated that changes in healthcare innovations are regulated by laws hence making them more difficult to implement. As per Lansisalmi (2006), the starting point of an innovation process may be a little rough and may lead to disabilities, discomforts or even death. Often times in the medical world, physicians tend to protect their reputations and personal autonomies which hinders innovation and the organization's learning process and also brings about a culture of secrecy, (Huntington, Gilliam & Rosen, 2000). It is important that new practices in patients is traditionally scrutinized thoroughly in the early development to avoid adoption of potentially harmful innovations, (Faulker & Kent, 2001). In order for innovation to thrive, a process of co-evolving between culture and technology is paramount. Technology highly influence the ability to innovate and is viewed as a source of new product innovation and a competitive advantage (Gunasekaran, 2010). Technology influences a huge per centage of innovations in medicine. With an end goal of reducing healthcare difficulties and concerns, the government forces the health organizations to adopt these changes. Establishing the need is only the first step, the next step is coming up with the best way to handle it which is either solving it internally or handing it over to the healthcare innovation company to take care of it, (Porter, 2013). Innovations originating from a healthcare organization, need to be tested, modified and lastly adopted. Conversely, the need is first met by the healthcare technology company that invents, performs the tests and markets the product to the healthcare organizations if it does not originate directly from the healthcare organizations, (Lee, 2013). Often times,

Healthcare technology companies take failed attempts by health organizations and try some new innovations on the research in order to come up with something new.

A study conducted by WHO (2016) confirms that over thirty per cent of children below the age of five years have shown signs of stunted growth. Latest research shows that seven thousand doctors are serving a population of forty million people in Kenya, (Talbot (2016). Out of the forty million people, twenty-five million people are subscribed mobile phone users. Featured phones and smartphones can be able to access an application called Med Africa founded by Stephen Kyalo & Mumo (2012). By collecting information from many sources, the platform is able to supply credible information on first aid recommendation from first local healthcare centers, (Mirit, 2014). In addition, it also provides health updates and health notifications from other hospitals. Based on the patient's choice on the app, it recommends a list of doctors and specialists MOH (2017). It is important to note that the best innovations are not always fruitful if the market or its surrounding is not prepared to accept it, (Varkey, 2008). Bearing in mind that healthcare innovation is hard, it is also good to know that dissemination is even harder.

2.5 Conceptual Framework

Conceptual framework is an orderly way of thinking widely about what and why a project takes place and how we can be able to understand this exercise. A framework assists us to understand why we are doing things in a certain way, (Kathori, 2009). It becomes a much better way of understanding other researchers' views on the matter. The research tool supports the researcher to develop understanding and acquire an awareness of a situation that is being accessed and be able to explain   it with clarity. It is subsequently possible to get an idea on how long it might take to move from one point to the next, (Mugenda & Mugenda, 2006).

A number of factors influence the financial performance of health firms according to a study done on the recent conceptual framework. Contribution of technology on the outcomes will be the major area of concern in this study. The diagrammatic representation is as presented in Figure 2.1.

Figure 2.1: Conceptual framework

Independent Variable   **Dependent Variable**

- Technology Investment on equipment
- IT cost (% of Admin cost)

Financial performance of hospitals (Return on Assets)

Inventory turnover

Firm size = log total assets
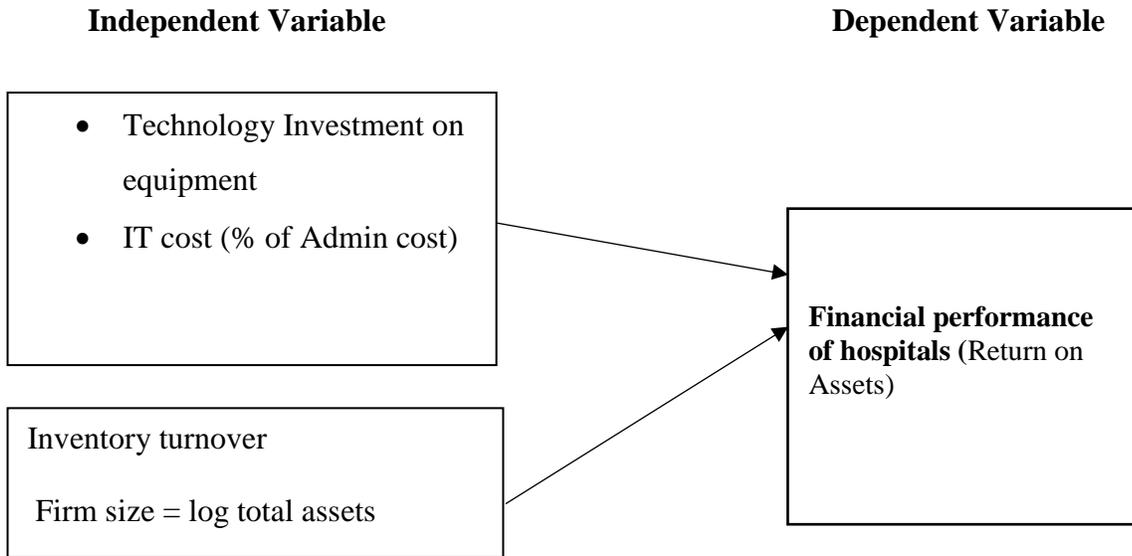
Control Variable

2.6 Summary of Literature Review

Little has been done on the impact of technology investment on the financial outcomes of healthcare firms according to the study. There is limited knowledge on designs that will lead to profitable innovations. This a clear where the innovation designers don't work on the knowledge already available from the healthcare services researchers and also when the healthcare researchers fail to provide the main insights on the upcoming innovations in that industry, (Lehoux et al. 2008). With a specific reference on healthcare firms, it is necessary to look into the precise effects of these technological investments. This comes due to the fact that no study has been done to look into the effects of technological innovations on financial outcome of healthcare firms hence

providing a research gap despite their strategic positioning to incorporate technological investments. Technological investments are incorporated in different contexts and the above literature gives insights on how it is done.

The contextual differences among firms in Kenya shows that effects of technology on the financial performance, done by other researchers may not be assumed to showcase the impacts of innovation in technology on the outcomes of financial performance of healthcare sector in Kenya. The study of the results of technology investment on financial performance of the healthcare firms is carried out with this consideration in mind.

CHAPTER THREE: REASERCH METHODOLOGY

3.1 Introduction

In this chapter our main focus will be on the population, research design data analysis and the population sample. It also shows how data was implemented in attempt to achieve the objective of the study and eventually give an explanation on the data analysis process.

3.2 Research Design

The study employed descriptive research design. Mugenda & Mugenda (2003), braces the approach that a descriptive research design helps the researcher to come up with a formula for a more specific problem statement. This design is aimed to give an explanation of the causes and the relationship that exists between the dependent and independent variables.

The main goal of this descriptive research design was to provide information to describe the important aspects as it exists at present, (Kathori, 2001) in the healthcare industry.

3.3 Population

Cooper & Schindler (2007), defines population as a group that the researcher focuses on in accordance to a target population from which information is obtained. The population of the study involved 9 hospitals and clinics in Nairobi. The entire group of elements or individuals that have a common observable characteristic, (Kombo & Tromp, 2006). Secondary data was used to carry out the analysis. This was mainly from the financial statements of the health facilities.

3.4 Data Collection

Secondary data was used in this study to determine the cost of technology investment in the healthcare firms. This data was obtained from the healthcare facilities financial reports and the publications over a period of 5 years i.e. between 2013-2017.

3.5 Diagnostic test

The strength and nature and strength of relationship that exists between the dependent and independent variables in linear regression model was measured through various diagnostic test such as the test of normality, autocorrelation and multicollinearity test. Normality is the test for the assumption that the residual of the residual of the response variable are normally distributed around the mean. This is determined using the Shapiro walk-test. Autocorrelation is the measurement of the similarity between a certain time series and a lagged value if the same tie series over successful time intervals. It was tested using Durbin -Watson statistic. Multicollinearity is said to occur when there is nearly exact or exact linear relationship among two or more independent variables. It was tested by determinant of correlation matrices, which varies from zero to one. When there is a complete linear dependence of outcome, the outcome is zero and the outcome near zero show strong multicollinearity, (Cooper & Schindler, 2006).

3.6 Data Analysis

Data analysis is a method used to make conclusions from the data collected though objective and systematic identification of distinct characteristics, (Bryman & Bell, 2003). SPSS was used in the collection and tabulation of data collected for clarity. This produced descriptive and inferential statistics used in drawing conclusions on the samples. Multilinear regression model then measured the relationship between independent and dependent variables as explained in this model below.

The following regression model was used.

$Y = \alpha + \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4\varepsilon$

Where:

Y = financial performance of medical firms (ROA)

β0 = is the regression constant

β 1, β 2, β 3, β 4, are the coefficient of independent variables.

X1= Technology investment

X2= IT cost (% of Admin cost)

X3 = Inventory turnover

X4 = Firm size

ε =Error term and α= constant

The variables are measured based on the following;

Table 3.1 Variable Measurement

	Variables	**Measurement**
Y	Financial performance	Return on assets = Net Income Total Assets
X1	Technology investment	Log of Additional cost invested on equipment
X2	IT cost	% of Admin cost
X3	Inventory turnover	COGS Average Inventory
X4	Firm size	Log (total assets)

3.7 Test of Significance

T-statistic and multi-linear regression were used to determine the relative importance or sensitivity

of each independent variables affecting the financial performance of the healthcare firms.

Performance was measured using Return on Asset of the health facilities while the influence of each technological investment was measured based on the regression analysis. In order to find out the relevance effect of technological innovations on financial performance, the results of the study must also be significant. Results are said to be statistically within 0.05 level, which means that the significant value is smaller than 0.05. the significant was determined by the t-value which indicate how many standard errors means the sample diverges from the tested value.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSIONS

4.1 Introduction

This section represents study's findings established on the objectives of research. This chapter focused on collected data analysis from financial reports of selected healthcare firms to determine the impact of technology investment on financial performance of healthcare firms in Nairobi. Using descriptive statistics, correlation analysis and regression analysis, the results of the study were presented in form of tables for easy interpretation.

4.2 Diagnostic Tests

The researcher carried out diagnostic tests on the collected data. A test of Multicollinearity was undertaken. Tolerance of the variable and the VIF value were used where values more than 0.2 for Tolerance and values less than 10 for VIF means that there is no Multicollinearity. For multiple regressions to be applicable there should not be strong relationship among variables. From the findings, the all the variables had a tolerance values >0.2 and VIF values <10 as shown in table 4.1 indicating that no Multicollinearity exists among the independent variables.

Table 4.1: Multicollinearity Test for Tolerance and VIF

	Collinearity Statistics	
Variable	**Tolerance**	**VIF**
Technology investment	0.310	1.326
IT cost	0.380	1.367
Firm size	0.706	1.417
Inventory turnover	0.503	1.99

Source: Research Findings (2018)

Shapiro-walk test and Kolmogorov-Smirnov test was used in normality test. The null hypothesis for the test was that the secondary data was not normal. If the p-value recorded was more than 0.05, the researcher would reject it. The test findings are as illustrated in table 4.2.

Table 4.2: Normality Test

ROA	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Technology investment	.149	45	.300	.857	45	.853
IT cost	.156	45	.300	.906	45	.822
Firm size	.172	45	.300	.869	45	.723
Inventory turnover	.165	45	.300	.880	45	.784
a. Lilliefors Significance Correction						

Source: Research Findings (2018)

Both Kolmogorov-Smirnova and Shapiro-Wilk tests recorded o-values greater than 0.05 implying that the data used in research was distributed normally and therefore the null hypothesis was rejected. This data was therefore appropriate for use to conduct parametric tests such as Pearson's correlation, regression analysis and analysis of variance.

Autocorrelation tests were executed so as to check for correlation of error terms across time periods. Autocorrelation was tested using the Durbin Watson test. A Durbin Watson statistic of 1.909 indicated that the variable residuals were not serially correlated since the value was within the acceptable range of between 1.5 and 2.5.

Table 4.3: Autocorrelation Test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.690[a]	.476	.423	.01459308	1.909

a. Predictors: (Constant), Firm Size, Technology investment, IT cost, Inventory turnover

b. Dependent Variable: ROA

Source: Research Findings (2018)

4.3 Descriptive Analysis

Descriptive statistics gives a presentation of the mean, maximum and minimum values of variables applied together with their standard deviations in this study.

Table 4.4: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ROA	45	-.01770	.06140	.0234231	.01921356
Technology investment	45	8.0400	15.7500	12.345111	2.0620771
IT cost	45	.079	.457	.21262	.099296
Inventory turnover	45	.214	.948	.47762	.174344
Firm Size	45	7.144	8.414	7.77667	.389229
Valid N (listwise)	45				

Source: Research Findings (2018)

Table 4.4 shows the descriptive statistics for the variables applied for the research. An analysis of all the variables was obtained using SPSS software for the period of five years (2013 to 2017) on an annual basis. Financial performance had 0.0234 as mean with a 0.192 standard deviation. Technology investment had a 12.3451 mean and 2.0621 for standard deviation. Inventory turnover resulted to 0.4776 mean with a 0.1743 standard deviation. IT cost had a mean of 0.2126 and a standard deviation of 0.0993 while firm size recorded a 7.7767 mean with a 0.3892 standard deviation.

4.4 Correlation Analysis

Correlation analysis are used to test whether a relationship exists between two variables and often range between (-) strong negative correlation and (+) perfect positive correlation. The study employed the Pearson correlation to analyze the level of correlation between the financial performance of healthcare firms in Nairobi and the independent variables for this study (technology investment, Inventory turnover, firm size and inventory turnover).

The study found out that there was a positive and statistically significant correlation ($r = .360$, $p = .015$) between IT cost and financial performance. The study further established that a positive and significant correlation exists between firm size and financial performance of healthcare firms in Nairobi as evidenced by ($r = .657$, $p = .000$). Inventory turnover was found to have a weak positive but significant association with financial performance as evidenced by ($r = .345$, $p = .020$). Technology investment was found to have an insignificant correlation with financial performance as evidenced by ($r = .089$, $p = .560$).

Table 4.5: Correlation Analysis

		ROA	Technology investment	IT cost	Inventory turnover	Firm Size
ROA	Pearson Correlation	1				
	Sig. (2-tailed)					
Technology investment	Pearson Correlation	.089	1			
	Sig. (2-tailed)	.560				
IT cost	Pearson Correlation	.360*	.103	1		
	Sig. (2-tailed)	.015	.499			
Inventory turnover	Pearson Correlation	.345*	.137	.563**	1	
	Sig. (2-tailed)	.020	.370	.000		
Firm Size	Pearson Correlation	.657**	.007	.301*	.359*	1
	Sig. (2-tailed)	.000	.965	.045	.015	

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

c. Listwise N=45

Source: Research Findings (2018)

4.6 Regression Analysis

Financial performance of healthcare firms in Nairobi was regressed against four predictor variables; technology investment, Inventory turnover, IT cost and firm size. The regression analysis was executed at 5% significance level. The study obtained the model summary statistics as illustrated in table 4.6 below.

Table 4.6: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.690[a]	.476	.423	.01459308	1.909

a. Predictors: (Constant), Firm Size, Technology investment, IT cost, Inventory turnover

b. Dependent Variable: ROA

Source: Research Findings (2018)

R squared is the coefficient of determination and depicts the variations in the response variable that is brought about by the changes in the predictor variables. From the outcome in table 4.6 above, the value of R square was 0.476, a discovery that 47.6 percent of the deviations in financial performance of healthcare firms in Nairobi are caused by changes in technology investment, firm size, IT cost and Inventory turnover of the firms. Other variables not included in the model justify for 52.4 percent of the variations in financial performance of healthcare firms in Nairobi. Also, the results revealed that there exists a strong relationship among the selected independent variables and the financial performance of healthcare firms in Nairobi as shown by the correlation coefficient (R) equal to 0.690.

Table 4.7: Analysis of Variance

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.008	4	.002	9.068	.000[b]
	Residual	.009	40	.000		
	Total	.016	44			

a. Dependent Variable: ROA

b. Predictors: (Constant), Firm Size, Technology investment, IT cost, Inventory turnover

Source: Research findings (2018)

The significance value is 0.000 which is less than p=0.05. This implies that the model was statistically significant in predicting how technology investment, firm size, IT cost and Inventory turnover affects financial performance of healthcare firms in Nairobi.

The researcher used t-test to determine the significance of each individual variable used in this study as a predictor of financial performance of healthcare firms in Nairobi. The p-value under sig. column was used as an indicator of the significance of the association between the dependent and the independent variables. At 95% level of confidence, a p-value of less than 0.05 was interpreted as a statistical significance measure. As such, a p-value above 0.05 shows that a statistically insignificant association between the dependent and the independent variables. The findings are as indicated in table 4.7.

Table 4.8: Model Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.202	.047		-4.300	.000
Technology investment	.001	.001	.133	1.084	.285
IT cost	.050	.036	.259	1.378	.176
Inventory turnover	.010	.021	.091	.471	.640
Firm Size	.030	.006	.612	4.979	.000

a. Dependent Variable: ROA

Source: Research Findings (2018)

From the above results, it is evident that firm size produced positive and statistically significant values for this study (high t-value (4.979), $p < 0.05$). Technology investment, IT cost and Inventory turnover produced negative but statistically insignificant values for this study as shown by p values that are more than 5%.

The following regression equation was estimated:

$Y = -0.202 + 0.001X_1 + 0.050X_2 + 0.010X_3 + 0.030X_4$

Where,

Y = Financial performance

X_1 = Technology investment

X_2 = IT cost

X_3 = Inventory turnover

X_4 = Firm size

On the estimated regression model above, the constant = -0.202 shows that if selected independent variables (technology investment, Inventory turnover, IT cost and firm size) were rated zero, healthcare firms in Nairobi financial performance would be -0.202. A unit increase in IT cost would result to an increase in financial performance of healthcare firms in Nairobi by 0.050. A unit increase in firm size would result to an increase in financial performance of healthcare firms in Nairobi by 0.030 while a unit increase in inventory turnover and technology investment would lead to an increase in financial performance of healthcare firms in Nairobi by 0.010 and 0.001 respectively.

4.7 Discussion of Research Findings

The research purposed to explore the effect of technology investment on financial performance of healthcare firms in Nairobi. Technology investment is measured by natural logarithm of additional cost on equipment, IT cost as measured by the ratio of IT cost to total administrative cost, Inventory turnover as measured by ratio of cost of goods sold to average inventory and firm size as measured by natural logarithm of total assets were the independent variables while financial performance of healthcare firms in Nairobi as measured by return on assets on an annual basis was the dependent variable. The effect of each of the independent variable on the dependent variable was analyzed in terms of strength and direction.

The Pearson correlation coefficients between the variables revealed that a strong positive correlation exists between firm size and financial performance of healthcare firms in Nairobi. The association between IT cost and financial performance of healthcare firms in Nairobi was found to be weak, positive and significant. The study also showed that there exist a weak positive and

insignificant association between technology investment and financial performance of healthcare firms in Nairobi while Inventory turnover was found to have a weak and significant positive relationship with financial performance of s healthcare firms in Nairobi.

The model summary revealed that the independent variables: technology investment, IT cost, firm size and Inventory turnover explains 47.6% of variation in the dependent variable as depicted by an R^2 value implying that other factors were not included in the model that account for 52.4% of changes financial performance of healthcare firms in Nairobi. The model is fit at 95% confidence level as the F-value was 9.068. Therefore, the overall multiple regression model is statistically significant and suitable in predicting how the independent variables selected affects financial performance of healthcare firms in Nairobi.

This study is in agreement with Branch & Park (2009), who argued that firms that invest on research and development increases the firm's value, and in the process increases the sales and the profits of the firms. This is achieved when a company invests on research and development, which in turn leads to innovations in technology, which reduces cost and increases production hence resulting to increased profits of the company. Research has been done to show that there is a positive relationship between technology innovation and research and development, (Pakes & Grilliches, 2009). However, high-tech firms should be consistent in innovation in order to survive in the advanced market technology, (D'Aveni, 2014). Healthcare firms are considered to have similar characteristics with the high-tech, therefore they are expected to have a high research and development rate.

This study is also in agreement with Park et al., (2006) who argue there is a positive relationship between technology investments and a firm's financial performance. According to Park et al.

(2006), financial performance is positively correlated to research and development and patent intensity which are the dependent variables in the technological innovations. In the small and medium enterprises, the high technology rating indicates better financial performance, (Kim et al., 2009). A study was done, and it showed that when high-tech firms disclose their supply contract, they reported excess returns and also the operating cost was higher than those for non-high-tech companies (Kim & Kwon, 2015).

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This section summarizes the previous chapter's findings, conclusion and study limitations. The section also elucidates the policy recommendations that policy makers can implement to achieve the expected financial performance of healthcare firms in Nairobi. Lastly the chapter presents suggestions for further research which can be useful by future researchers.

5.2 Summary of Findings

The study sought to investigate the effect of technology investment on financial performance of healthcare firms in Nairobi. The independent variables for the study were technology investment, Inventory turnover, IT cost and firm size. The study adopted a descriptive cross-sectional research design. Financial reports of selected healthcare firms in Nairobi were used to retrieve secondary data which were analyzed using SPSS software version 22. The study used annual data for the 9 healthcare firms in Nairobi selected for this study covering a five-year time frame as from January 2013 to December 2017.

From the results of correlation analysis, a strong positive correlation exists between firm size and financial performance of healthcare firms in Nairobi. The association between technology investment and financial performance of healthcare firms in Nairobi was found to be weak and positive. The study also showed that there exist a weak positive association between IT cost and financial performance of healthcare firms in Nairobi while Inventory turnover was found to have a weak and significant positive relationship with financial performance of healthcare firms in Nairobi.

The co-efficient of determination R-square value was 0.476 implying that the predictor variables selected for this study explains 47.6% of changes in the dependent variable. This means that there are other factors not included in this model that account for 52.4% of changes in financial performance of healthcare firms in Nairobi. The model is fit at 95% confidence level and F-value of 9.068. Therefore, the overall multiple regression model was statistically significant and thus suitable in explaining how the financial performance of healthcare firms in Nairobi is affected by the selected independent variables.

The regression results show that when all the independent variables selected for the study have zero value, financial performance of healthcare firms in Nairobi would be -0.202. A unit increase in IT cost would result to an increase in financial performance of healthcare firms in Nairobi by 0.050. A unit increase in firm size would result to an increase in financial performance of healthcare firms in Nairobi by 0.030 while a unit increase in inventory turnover and technology investment would lead to an increase in financial performance of healthcare firms in Nairobi by 0.010 and 0.001 respectively.

5.3 Conclusion

From the findings of the study, it can be concluded from the study that financial performance of healthcare firms in Nairobi is significantly affected by technology investment, Inventory turnover, IT cost and firm size of the companies. Technology investment was noted to have a positive but statistically insignificant association with financial performance of healthcare firms in Nairobi and this means an increase in technology investment leads to an increase in financial performance though not to a significant extent. The study found that Inventory turnover had a positive but insignificant impact on financial performance of healthcare firms in Nairobi. The study therefore

concludes that inventory turnover leads to an increase in financial performance of healthcare firms in Nairobi but not to a significant extent.

The study established that firm size had a positive and significant impact on financial performance of healthcare firms in Nairobi and therefore it is concluded that higher levels of firm size leads to an increase in financial performance. IT cost was found to be statistically insignificant determinant of financial performance of healthcare firms in Nairobi and therefore this study concludes that IT cost does not significantly influence financial performance of healthcare firms in Nairobi.

This study concludes that independent variables chosen for this study technology investment, Inventory turnover, IT cost and firm size affect to a large extent financial performance of healthcare firms in Nairobi. It could be therefore concluded that these variables significantly affect financial performance as depicted by the p value of ANOVA summary. Since the four independent variables explain 47.6% of changes in financial performance of healthcare firms in Nairobi imply that the variables not included in the model explain 52.4% of changes in financial performance.

This finding concurs with Park et al., (2006) who argue there is a positive relationship between technology investments and a firm's financial performance. According to Park et al., (2006), financial performance is positively correlated to research and development and patent intensity which are the dependent variables in the technological innovations. In the small and medium enterprises, the high technology rating indicates better financial performance, (Kim et al., 2009). A study was done, and it showed that when high-tech firms disclose their supply contract, they reported excess returns and also the operating cost was higher than those for non-high-tech companies, (Kim & Kwon, 2015).

5.4 Recommendations

Technology investment was found to have an insignificant positive impact on financial performance of healthcare firms in Nairobi. The research therefore recommends that when firms are making budgets and setting money aside for technology investment, they should strike a balance between the benefit of technology and the costs associated with purchasing and maintain the technological equipment. They should take advantage of the positive influence of technology investment on financial performance while at the same time reducing the costs of technology.

The study found out that a positive relationship exists between financial performance and firm size. This study recommends adequate measures should be put in place by managers of these firms to improve and grow their financial performance by increasing their asset base. Healthcare firms and all firms in general should work on increasing their assets that will lead to an increase in financial performance because this translates to improved shareholder wealth which is the main goal of a firm.

The study established that there was a positive influence of IT cost on financial performance of healthcare firms in Nairobi though not significant. This study recommends adequate measures should be put in place by managers of these firms to improve their financial performance by maintaining and upgrading their investment in technologies. Healthcare firms that spend more on maintaining IT equipment are likely to report higher profits.

5.5 Limitations of the Study

The scope of this study was for five years 2013-2017. It has not been determined if the results would hold for a longer study period. Furthermore, it is uncertain whether similar findings would

result beyond 2017. A longer study period is more reliable as it will take into account major happenings not accounted for in this study.

One of the study's limitations of was the quality of the data. It is illusion to derive conclusions from the study since the legitimacy of the situation cannot be ascertained. The data that has been used is only assumed to be accurate. The measures used may keep on deviating from one year to another subject to prevailing condition. Secondary data that had already been retrieved was utilized for the study, unlike the primary data which is first-hand information. The study also considered selected determinants and not all the factors affecting financial performance of healthcare firms in Nairobi mainly due to limitation of data availability.

For data analysis purposes, the researcher applied a multiple linear regression model. Due to the shortcomings involved when using regression models such as erroneous and misleading results when the variable values change, the researcher cannot be able to generalize the findings with certainty. If more and more data is added to the functional regression model, the hypothesized relationship between two or more variables may not hold.

5.6 Suggestions for Further Research

This study focused on technology investment and financial performance of healthcare firms in Nairobi and relied on secondary data. A research study where data collection relies on primary data i.e. in-depth questionnaires and interviews covering all the healthcare firms in Nairobi is recommended so as to compliment this research.

The study was not exhaustive of the independent variables affecting financial performance of healthcare firms in Nairobi and this study recommends that further studies be conducted to incorporate other variables like management efficiency, growth opportunities, firm liquidity,

industry practices, age of the firm, political stability and other macro-economic variables. Establishing the impact of each variable on financial performance of healthcare firms in Nairobi will enable policy makers know what tool to use when maximizing shareholder's wealth.

The study concentrated on the last five years since it was the most recent data available. Future studies may use a range of many years e.g. from 2000 to date and this can be helpful to confirm or disapprove the findings of this study. The study limited itself by focusing on healthcare firms in Nairobi. The recommendations of this study are that further studies be conducted on other healthcare firms operating in Kenya. Finally, due to the shortcomings of regression models, other models such as the Vector Error Correction Model (VECM) can be used to explain the various relationships between the variables.

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APPENDIX I: LIST OF HEALTHCARE FACILITIES IN NAIROBI

1.   Gertrude's Children Hospital

2.   Nairobi Women Hospital

3.   Acacia Medical Center

4.   Avenue Healthcare

5.   The Mater Hospital

6.   AIC Kijabe Hospital

7   St Mary's Mission Hospital

8.   The Aga Khan University Hospital

9.   The Nairobi Hospital

APPENDIX II: DATA USED

COMPANY	Year	ROA	Technology investment	IT cost	Inventory turnover	SIZE(Shs.000)	Firm Size
Gertrude's Children Hospital	2013	0.02690	12.8800	0.144	0.425	19070779	7.280
	2014	0.02190	13.2400	0.151	0.380	19639370	7.293
	2015	0.01260	13.2400	0.172	0.306	21438729	7.331
	2016	0.01230	14.2400	0.165	0.214	22058297	7.344
	2017	0.00707	13.8900	0.160	0.271	22422351	7.351
Nairobi Women Hospital	2013	0.03300	11.1800	0.235	0.558	46137777	7.664
	2014	0.04100	11.1800	0.216	0.606	52021524	7.716
	2015	0.03900	11.6400	0.242	0.605	61944650	7.792
	2016	0.03100	12.5800	0.271	0.615	68177548	7.834
	2017	0.03900	9.7900	0.305	0.652	82907475	7.919
Acacia Medical Center	2013	0.04980	15.5600	0.250	0.468	185100000	8.267
	2014	0.03890	15.4300	0.162	0.450	207011000	8.316
	2015	0.03870	15.4100	0.160	0.442	226116000	8.354
	2016	0.03600	15.7500	0.184	0.341	241152000	8.382
	2017	0.02840	15.7200	0.179	0.283	259525000	8.414
Avenue Healthcare	2013	0.01100	9.9000	0.129	0.256	48957925	7.690
	2014	0.01500	11.8800	0.127	0.345	52683299	7.722
	2015	0.00250	10.8600	0.159	0.283	62211641	7.794
	2016	-0.01600	13.2000	0.164	0.415	69280267	7.841
	2017	0.00017	14.0300	0.162	0.422	55995671	7.748
The Mater Hospital	2013	0.04100	13.6100	0.405	0.659	52021524	7.716
	2014	0.03900	13.0700	0.415	0.752	61944650	7.792
	2015	0.03100	12.7100	0.394	0.742	68177548	7.834
	2016	0.03900	13.1600	0.423	0.565	82907475	7.919
	2017	0.04980	12.8000	0.457	0.610	185100000	8.267
AIC Kijabe Hospital	2013	0.02110	8.2400	0.159	0.430	49105498	7.691
	2014	0.02500	8.0400	0.150	0.410	76568930	7.884
	2015	0.02520	8.9900	0.153	0.464	107112469	8.030

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	2016	0.00300	9.3700	0.159	0.430	14135528	7.150
	2017	-0.01510	10.8500	0.150	0.410	13917895	7.144
St Mary's Mission Hospital	2013	0.06140	11.4900	0.150	0.470	69579795	7.842
	2014	0.04260	11.7400	0.108	0.270	71242659	7.853
	2015	0.03240	11.4800	0.110	0.360	79397808	7.900
	2016	0.04060	11.1800	0.094	0.328	88147289	7.945
	2017	0.03590	9.1900	0.079	0.258	103323540	8.014
The Aga Khan University Hospital	2013	0.02870	11.6100	0.420	0.820	100455558	8.002
	2014	0.03090	11.3600	0.354	0.625	124881964	8.096
	2015	0.02510	11.6100	0.273	0.798	175808828	8.245
	2016	0.02470	11.7600	0.280	0.762	198484270	8.298
	2017	0.03220	10.9600	0.260	0.948	210877927	8.324
The Nairobi Hospital	2013	0.00840	12.3500	0.161	0.476	18000858	7.255
	2014	-0.00630	12.4000	0.135	0.411	16778631	7.225
	2015	-0.01770	14.9100	0.179	0.340	15077051	7.178
	2016	0.00300	15.7500	0.179	0.367	14135528	7.150
	2017	-0.01510	15.3000	0.185	0.451	13917895	7.144